

Response under 37 C.F.R. §1.116
Serial No. 10/069,532
Attorney Docket No. 020245

REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1 – 4, 7 – 8, 14 and 17-20 are now pending in the present application, claims 9-13 having been cancelled by the present Amendment. Claims 1 – 4, 7 – 14 and 17-20 stand rejected. The rejections set forth in the Office Action are respectfully traversed below.

It is respectfully submitted that the present amendments do not raise new issues requiring further consideration and/or search, and should be entered and considered. For example, claim 1 now recites “setting a specified time based on which charging is started.” This feature broadly encompasses features found, e.g., in cancelled claims 11 and 12.

As will be discussed in detail below, it is respectfully submitted that each of **Dunstan, Koenck and Chalasani et al.** do not disclose or suggest the following subject matter of claims 1 and 3.

A measuring means for measuring a state of said secondary battery and a memory for storing measured information thereof and information regarding properties of said secondary battery; a load of an electric motor driven by electric power supplied by said secondary battery; a controller for controlling drive of said load and a display and operation unit having a time setting function for setting a specified time based on which charging is started and having a time displaying function.

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Further, none of the references disclose an interface to connect a charger via a system bus for charging said secondary battery based on information of said measuring means and/or said memory and the specified time, as recited in claim 1.

Moreover, none of the references disclose a charger for charging said secondary battery based on information of said measuring means and/or said memory and the specified time; and an interface for connection a charger with said measuring means and/or said memory, and said timer and said controller via a system bus, as recited in claim 3.

Rejections Under 35 U.S.C. §103

Claims 1 – 4, 7 – 12 and 17 – 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Dunstan** (USP 5,572,110) in view of **Koenck** (USP 4,455,523). Claims 13 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Dunstan** and **Koenck** as applied to claims 3 and 4 above, and further in view of **Chalasani et al.** (U.S. Patent No. 5,969,436). For the reasons set forth in detail below, these rejections, to the extent they are considered to apply to the amended claims, are respectfully traversed.

The present invention relates to an electric device of an electric vehicle, such as a compact electric automobile or an electric bicycle, driven using the electric power of a secondary battery. Moreover, it is an object of embodiments of the invention to improve the accuracy with which the remaining capacity of the secondary battery with comparatively large capacity used in the electric vehicle is grasped, and to make it possible to perform charge of the secondary battery

at a suitable time. Another object of embodiments of the invention is to make it possible to start charge by specifying time, to charge by specifying a charge completion time, or to calculate and indicate the charge completion time, and also to perform automatic refresh, automatic charge and the like of secondary batteries to thereby improve managing accuracy and handling ease of the secondary batteries especially in electric vehicles.

In Item 8, page 5 of the present Office Action, the Examiner responds to the patentability arguments set forth in the September 8, 2004 response asserting that the previous arguments were not persuasive because **Dunstan** suggests that the user may select charge times, citing column 14, line 49ff and particularly column 14, line 62 of **Dunstan**.

Column 14, lines 61–62 of **Dunstan** states, “*Alternatively, the user can select a custom charge time.*” The sentence at column 14, lines 61 - 62 appears to be the only portion of the reference related to selecting a charge time. Moreover, the Examiner has not cited any other portions of the **Dunstan** reference as providing further teaching of selecting the charge time.

In the context of column 14, lines 37 – 65 of **Dunstan**, the passage cited by the Examiner (quoted above) can only be interpreted to mean that a user can select how long a charging operation will performed (e.g., 30 minutes, 1 hour, etc.), but not *when* the charging operation is started or completed. More particularly, column 14, lines 37 – 65 and Fig. 12 of **Dunstan** describe a method of predicting recharge time of a battery based on selected charge conditions available to a user (i.e., Quick Charge, Medium Charge, Conservative Charge) and other conditions, such as present battery capacity (see step 142, Fig. 12). However, as an alternative to

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letting the system predict the recharge time based on the selected charging option, the user can apparently simply select the length of recharge time.

In view of the **Dunstan** disclosure discussed above, claims 1 and 3 have been amended to clarify the time setting function of the claimed “display and operation unit.” Specifically, claims 1 and 3 have been amended to recite “a display and operation unit having a time setting function for ~~said timer~~ setting a specified time based on which charging is started ... ”

Note, the “specified time based on which charging is started” can encompass both a *charge starting time* and a *charge completion time*. That is, the specified charge completion time is used to determine when charging should start.

The Examiner cited column 13 of **Dunstan** (see present Office Action, page 5, item 8, lines 4-7) as disclosing the features recited claims 11 and 12 (i.e., “*time specifying means for specifying a charge starting time*”). The Examiner asserts that the “algorithms suggested at col. 13 define residual capacity management processes which involve time parameters necessary to ‘*periodically adjust the charger’s output*’” (see Office Action, page 5, item 8, lines 4-7).

Column 13, lines 45 - 48 of **Dunstan** disclose a Level 2 smart battery charger wherein the charging algorithm in the smart battery *may periodically adjust the smart battery charger’s output to meet its needs*. However, the operation of the Level 2 smart battery charger is well known. Contrary to the Examiner’s assertion, the Level 2 smart battery charger responds to charge voltage and charge current messages sent to it by the smart battery *34 to start a charging output* (see, e.g., col. 13, lines 41-43. Moreover, it is noted that periodic adjustment of the smart

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battery charger's output is part of an ongoing charging operation and not the start of a charging operation.

The smart battery charger disclosed by **Dunstan** does *not set a specified time based on which charging is started* and charge a battery based on the specified time, as presently recited in claims 1 and 3. According to **Dunstan**, charging is performed when the smart battery requests a charge based on the smart battery's charging needs. However, **Dunstan** is silent with respect to specifying a time based on which charging is started. Also, note that the sentence at column 14, line 62, relates to how long a recharge takes, but does not relate to setting a time for starting a recharge.

The Examiner asserts that the **Chalasani et al.** reference "suggests a charging scheme of a battery based on time of day at col. 4, line 50. Such charging would necessarily require a start and/or stop time." See Office Action, page 5, Item 8, lines 7-9.

Chalasani et al. disclose a battery charger that controls charging of a battery 220 based on information provided to a controller 250 from a timer 260 and a temperature transducer 270 (see column 4, lines 19 - 21). The battery charger may charge the battery 220 if the temperature transducer 270 detects that the ambient temperature of the surroundings of the battery 220 is within a certain range (see col. 4, lines 27 -33). Moreover, as noted above, **Chalasani et al.** indicate that battery charging can be based on time of day (see col. 4, lines 48 – 51).

However, **Chalasani et al.** do not disclose or suggest *a charger for charging said secondary battery based on information of said measuring means and/or said memory and the*

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specified time, as recited in claims 1 and 3. In accordance with the claimed invention, charging is performed based on information regarding the state of the battery (whether stored in memory or from the measuring means) *and* the specified time.

In contrast, **Chalasani et al.** teach a control circuit 250 that selectively couples a battery 220 to a source of electrical power 205 to charge the battery 220 based on ambient temperature *or* time of day. Further, **Chalasani et al.** teach that the battery 220 is disconnected from the load when the battery has discharged below its low voltage threshold (see, e.g., col. 5, lines 2-4). However, **Chalasani et al.** do not teach or suggest that charging is performed based on the specified time *and* the measured state of the battery 220. **Chalasani et al.** simply teach that intermittent charging can be performed at a preset time of day, and that charging occurs for a preset time, regardless of the state of the battery.

The **Koenck** reference was cited to teach the claimed display function. The display screen 12 of **Koenck** displays digits representing battery conditions, but lacks disclosure of a time displaying function. **Koenck** does not alleviate any of the deficiencies discussed above.

In view of the above remarks, it is respectfully submitted that none of the cited references, whether taken alone or in combination, disclose, suggest or render obvious a device, as recited in claims 1 and 3, including a display and operation unit having a time setting function for setting a specified time based on which charging is started and having a time displaying function, and a charger for charging a secondary battery based on a measured state of the battery

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(i.e., information of a measuring means and/or a memory) and the specified time. The dependent claims should also be allowable by virtue of their dependency on claims 1 and 3.

CONCLUSION

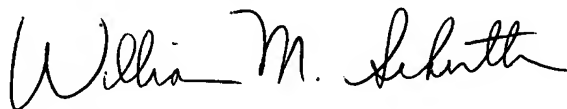
For the reasons set forth in detail above, it is respectfully submitted that all pending claims are in condition for allowance. An indication of allowability of all pending claims is respectfully requested.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

In the event that any fees are due in connection with the filing of this paper, please charge any fees to Deposit Account No. 50-2866.

Respectfully submitted,

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